ABSTRACT

A valve assembly connects into a drill string for opening and closing a passage within the drill string. The valve assembly has an inner valve member for opening and closing an inner passage of the drill string. The valve member moves between the open and closed positions in response to axial movement of the drill string. Lifting the drill string causes the upper portion to move upward relative to the lower portion, bringing along with it the valve member, while the valve sleeve remains stationary with the lower portion, opening the valve. The valve assembly can include an annular valve assembly for opening and closing an annular passage located around the inner passage. The annular valve assembly is opened and closed by increasing the pressure in the annular passage above the annular valve assembly.